LISTING OF CLAIMS

1.-28. (Cancelled)

29. (New) A method for detecting fluorescence from a sample in a channel plate comprising:

providing an excitation beam of light to the sample and the channel plate, wherein the excitation beam of light produces a fluorescent trail, wherein the fluorescent trail comprises a first portion from the channel plate and a second portion from the sample;

positioning the excitation beam of light to increase the spatial resolution between the first portion and the second portion; and

collecting the second portion on a detector.

30. (New) The method as defined in Claim 29, wherein the detector is selected from the group consisting of charge coupled devices, CMOS detectors, photodiode, photodiode array, photomultiplier tubes, and photomultiplier tube arrays.

31. (New) The method as defined in Claim 29, wherein the excitation beam of light is positioned at an angle less than or equal to about 20° relative to a channel axis.

32. (New) The method as defined in Claim 29, wherein a collection optics system collimates the fluorescent trail and refocuses the second portion onto the detector.

33. (New) The method as defined in Claim 32, wherein the collection optics further removes scattered light from the excitation beam using a long pass filter.

34. (New) The method as defined in Claim 32, wherein the collection optics further removes scattered light from the excitation beam using a band pass filter.

35. (New) The method as defined in Claim 29, wherein positioning comprises directing the excitation beam of light substantially parallel to the channel plate into a reflective mirror, which reflects the excitation beam of light into the sample.

36. (New) The method as defined in Claim 35, wherein reflecting further comprises directing the excitation beam of light from the reflective mirror through a prism.

37. (New) An apparatus for detecting fluorescence from a sample in a channel plate comprising:

a light source operable to generate an excitation beam of light, wherein the excitation beam of light produces a fluorescent trail, wherein the fluorescent trail comprises a first portion from the channel plate and a second portion from the sample;

a mirror operable to position said excitation beam of light into the sample, increasing the spatial resolution between the first portion and the second portion; and

a detector operable to image the second portion.

38. (New) The apparatus as defined in Claim 37, wherein the detector is selected from the group consisting of charge coupled devices, CMOS detectors, photodiode, photodiode array, photomultiplier tubes, and photomultiplier tube arrays.

39. (New) The apparatus as defined in Claim 37, further comprising collection optics, wherein the collection optics comprises a long pass filter operable to remove scattered light at a wavelength of said excitation beam of light.

40. (New) The apparatus as defined in Claim 37, further comprising collection optics, wherein the collection optics comprises a transmission defraction grating operable to separate light into differing wavelengths.

41. (New) The apparatus as defined in Claim 37, further comprising a prism operable to direct the excitation beam of light toward the sample.

42. (New) The apparatus as defined in Claim 37, wherein the light source is a laser.

43. (New) A method for detecting fluorescence from a sample in a channel plate comprising:

providing an excitation beam of light to the sample and the channel plate, wherein the excitation beam of light produces a fluorescent trail, wherein the fluorescent trail comprises a first portion from the channel plate and a second portion from the sample;

positioning the excitation beam of light to increase the spatial resolution between the first portion and the second portion; and

collecting the second portion and substantially smaller amounts of the first portion on a detector.

44. (New) The method as defined in Claim 43, wherein the excitation beam is positioned at an angle less than or equal to about 20° relative to a channel axis.

45. (New) The method as defined in Claim 43, wherein providing an excitation beam of light comprises providing a laser to generate the excitation beam of light.

46. (New) The method as defined in Claim 43, wherein positioning comprises directing the excitation beam of light substantially parallel to the channel plate into a reflective mirror, which reflects the excitation beam of light into the sample.

47. (New) The method as defined in Claim 46, wherein reflecting further comprises directing the excitation beam of light from the reflective mirror through a prism.

48. (New) A method for detecting fluorescence from a sample in a channel plate comprising:

providing an excitation beam of light to the sample and the channel plate, wherein the excitation beam of light produces a fluorescent trail, wherein the fluorescent trail comprises a first portion from the channel plate and a second portion from the sample;

positioning the excitation beam of light to increase the spatial resolution between the first portion and the second portion; and

collecting the first portion and the second portion on spatially different sections of a detector.

49. (New) The method as defined in Claim 48, wherein the excitation beam is positioned at an angle less than or equal to about 20° relative to a channel axis.

50. (New) The method as defined in Claim 48, further comprising:

providing a light source operable to generate the excitation beam of light; and

providing a mirror operable to position the excitation beam of light.

51. (New) An apparatus for detecting fluorescence from a sample in a channel plate comprising:

a light source operable to generate an excitation beam of light, wherein the excitation beam of light produces a fluorescent trail, wherein the fluorescent trail comprises a first portion from the channel plate and a second portion from the sample;

a mirror operable to position said excitation beam of light into the sample, increasing the spatial resolution between the first portion and the second portion;

collection optics to collimate and focus the fluorescent trail; and

a detector operable to image the second portion.

52. (New) The apparatus according to Claim 51, wherein the collection optics are oriented about 90 degrees with respect to a channel axis.